

Remarks

Claims 1 to 19 are pending. Claims 1 to 19 are amended. Support for the amendment to claims 1, 18 (“bonding directly”) and 19 can be found at least in the specification as originally filed. For example:

<u>Location in Specification</u>	<u>Supporting Language</u>
Page 2, line 5	“A multi-layer structure includes a fluoropolymer <u>bonded to a substrate.</u> ”
Page 2, line 10	“a method of <u>bonding a fluoropolymer to a substrate</u> includes...”
Page 2, line 13	“a method of <u>bonding a fluoropolymer to a substrate</u> includes...”
Page 4, lines 23-25	“Actinic radiation is electromagnetic radiation having a wavelength <u>capable of affecting bonding between the fluoropolymer and the substrate</u> in the presence of the bonding composition.”

One of ordinary skill in the art will recognize that, due to the chemical composition of the fluoropolymer and substrate layers and the bonding composition described therein, the bonding between the fluoropolymer and substrate as described in the present application includes covalent bonding.

Support for the amendment to claims 2-17 can be found in original claims 2-17 as filed. The amendment to claims 2-17 is further discussed below. Further support for the amendment to claim 18 can be found in the examples as originally filed.

Claim Objections

Claims 2-17 stand objected to because they depend from claims that do not exist. Claims 2-17 have been appropriately corrected to indicate the right dependencies. The Applicants respectfully submit that this correction of a clear clerical error to reflect the dependencies that were obviously intended does not add new matter to this application. Support for the amendment to claims 2-17 can be found in original claims 2-17 as filed.

§ 102 Rejections

According to the MPEP, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” See MPEP 2131 (quoting *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631) (emphasis added).

Amended claim 1 relates to a composite article comprising a fluoropolymer having a surface, a substrate having a surface, and a bonding composition interposed between the surface of the fluoropolymer and the surface of the substrate. The bonding composition includes a light-absorbing compound and an electron donor. Furthermore, the fluoropolymer shares at least one covalent bond with the substrate, that is, the fluoropolymer shares at least one bond to the substrate that is not intervened by a linking group.

Stoeppelmann

Claims 1, 3, 6-8, 13, 16 and 17 stand rejected under 35 USC § 102(b) as being anticipated by Stoeppelmann (U.S. Patent 5,869,157) [hereinafter Stoeppelmann].

Stoeppelmann does not teach or describe the invention described in independent claim 1. In particular, the polyamide “substrate” of Stoeppelmann is bonded directly to the intermediate layer described therein. That intermediate layer then interacts with the fluoropolymer to promote adhesion.

Stoeppelmann does not teach or describe a composite fluoropolymer article including a bonding composition including a light-absorbing compound and an electron donor wherein the fluoropolymer shares at least one covalent bond with the substrate. Thus, Stoeppelmann does not disclose all of the elements of amended claim 1.

Claims 2, 6-8, 13, 16 and 17 each ultimately depend from claim 1 and add patentable features thereto. In light of the foregoing discussion with respect to claim 1, Stoeppelmann also does not teach or describe the invention as claimed in claims 2, 6-8, 13, 16 and 17.

The Applicants respectfully submit that the rejection of claims 1, 3, 6-8, 13, 16 and 17 under 35 USC § 102(b) as being anticipated by Stoeppelmann has been overcome and kindly request that this rejection be withdrawn.

Nishii

Claims 1-4, 6, 12-16, 18 and 19 stand rejected under 35 USC § 102(b) as being anticipated by Nishii (U.S. Patent 5,470,617) [hereinafter Nishii].

With respect to independent claim 1, Nishii does not teach or describe the invention described in independent claim 1. In particular, Nishii describes only a process for modifying the surfaces of molded materials made of fluorine resins. This process requires the presence of both an ultraviolet-absorbing compound and a fluorosurfactant. Once modified, Nishii teaches that the fluoropolymer film is adhered to a substrate (all of the examples show a stainless steel plate) with an epoxy resin adhesive. See Nishii, Column 6, lines 19-24. Thus, in Nishii, it is the epoxy layer that interacts with the substrate. There is no direct bonding between the fluoropolymer and the substrate. Thus, Nishii does not disclose all of the elements of amended claim 1.

Claims 2-4, 6, and 12-16 each ultimately depend from claim 1 and add patentable features thereto. In light of the foregoing discussion with respect to claim 1, Nishii also does not teach or describe the invention as claimed in claims 2-4, 6, and 12-16.

With respect to independent claim 18, Nishii also does not teach or describe a treated fluoropolymer substrate suitable for bonding directly to a polymeric substrate comprising a surface exposed to a combination of a light-absorbing compound and an electron donor and actinic radiation wherein the fluoropolymer substrate surface is substantially free of fluorosurfactant, as described in amended claim 18. In fact, it is very clear from the disclosure of Nishii that the fluorosurfactant is necessary so that “sufficient amounts of ultraviolet-absorbing compounds are coated uniformly on the surfaces of the molded materials made of fluorine resins.” See Nishii, column 4, lines 62-5. Thus, Nishii does not disclose all of the elements of amended claim 18.

With respect to independent claim 19, Nishii does not teach or describe a laminated article comprising a fluoropolymer bonded to a substrate by a bonding composition including a light-absorbing compound and an electron donor exposed to actinic radiation wherein the fluoropolymer shares at least one covalent bond with the substrate, as described in amended claim 19. As indicated above, in Nishii, it is the epoxy layer that interacts with the substrate. There is no direct bonding between the fluoropolymer and the substrate. Thus, Nishii does not disclose all of the elements of amended claim 19.

The Applicants respectfully submit that the rejection of claims 1-4, 6, 12-16, 18 and 19 under 35 USC § 102(b) as being anticipated by Nishii has been overcome and kindly request that this rejection be withdrawn.

Vasta

Claims 1, 3, 6, 7, 10 and 13-15 stand rejected under 35 USC § 102(b) as being anticipated by Vasta (U.S. Patent 4,495,247) [hereinafter Vasta].

Vasta does not teach or describe the invention described in independent claim 1. In particular, the primer composition of Vasta is bonded directly to the substrate described therein (through the amino alkyl alkoxy silane component). The primer composition then interacts with the fluoropolymer to promote adhesion between the primer composition and the fluoropolymer. The fluoropolymer of Vasta does not have at least one covalent bond with the substrate as described in amended claim 1.

Further, Vasta does not teach or describe a composite fluoropolymer article including a bonding compositing including a light-absorbing compound and an electron donor wherein the fluoropolymer shares at least one covalent bond with the substrate. Thus, Vasta does not disclose all of the elements of amended claim 1.

Claims 3, 6, 7, 10 and 13-15 each ultimately depend from claim 1 and add patentable features thereto. In light of the foregoing discussion with respect to claim 1, Vasta also does not teach or describe the invention as claimed in claims 3, 6, 7, 10 and 13-15.

The Applicants respectfully submit that the rejection of claims 1, 3, 6, 7, 10 and 13-15 under 35 USC § 102(b) as being anticipated by Vasta has been overcome and kindly request that this rejection be withdrawn.

Tannenbaum

Claims 1, 3, 6, 8, 12, 14 and 15 stand rejected under 35 USC § 102(b) as being anticipated by Tannenbaum (U.S. Patent 5,562,991) [hereinafter Tannenbaum].

Tannenbaum does not teach or describe the invention described in independent claim 1. In particular, the primer composition of Tannenbaum is bonded directly to the smooth substrate described therein. The primer composition then interacts with the fluoropolymer to promote adhesion between the primer composition and the fluoropolymer by forming a mechanical

interlock. The fluoropolymer of Tannenbaum does not have at least one covalent bond with the substrate as described in amended claim 1.

Tannenbaum does not teach or describe a composite fluoropolymer article including a bonding compositing including a light-absorbing compound and an electron donor wherein the fluoropolymer shares at least one covalent bond with the substrate. Thus, Tannenbaum does not disclose all of the elements of amended claim 1.

Claims 3, 6, 8, 12, 14 and 15 each ultimately depend from claim 1 and add patentable features thereto. In light of the foregoing discussion with respect to claim 1, Tannenbaum also does not teach or describe the invention as claimed in claims 3, 6, 8, 12, 14 and 15.

The Applicants respectfully submit that the rejection of claims 1, 3, 6, 8, 12, 14 and 15 under 35 USC § 102(b) as being anticipated by Tannenbaum has been overcome and kindly request that this rejection be withdrawn.

§ 102/103 Rejections

According to the MPEP, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” See MPEP 2131 (quoting *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631) (emphasis added). Furthermore, “[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” See MPEP 2143 (emphasis added).

Stoeppelmann

Claims 18 and 19 stand rejected under 35 USC § 102(b) as anticipated by or, in the alternative, under 35 USC § 103(a) as obvious over Stoeppelmann.

Claim 18 relates to a treated fluoropolymer substrate suitable for bonding directly to a polymeric substrate. The fluoropolymer substrate comprises a surface exposed to a combination of a light-absorbing compound and an electron donor and actinic radiation. Also, the fluoropolymer substrate surface is substantially free of fluorosurfactant.

As discussed above with respect to claim 1, Stoeppelmann does not teach, suggest or describe a treated fluoropolymer substrate suitable for bonding directly to a polymeric substrate. In particular, the polyamide “substrate” of Stoeppelmann is bonded directly to the intermediate layer described therein. That intermediate layer then interacts with the fluoropolymer to promote adhesion. Thus, claim 18 is patentable over Stoeppelmann.

Claim 19 relates to a laminated article. The laminated article comprises a fluoropolymer bonded to a substrate by a bonding composition including a light-absorbing compound and an electron donor exposed to actinic radiation. Furthermore, the fluoropolymer shares at least one covalent bond with the substrate.

Again, Stoeppelmann does not teach, suggest or describe the invention as described in claim 19. In particular, Stoeppelmann does not teach, suggest or describe a fluoropolymer that shares at least one covalent bond with a substrate. Thus, Applicants assert that claim 19 is patentable over Stoeppelmann.

The Applicants respectfully submit that rejection of claims 18 and 19 under 35 USC § 102(b)/103(a) as being anticipated by or in the alternative obvious over Stoeppelmann has been overcome and kindly request that this rejection be withdrawn.

Vasta

Claim 19 stands rejected under 35 USC § 102(b) as anticipated by or, in the alternative, under 35 USC § 103(a) as obvious over Vasta.

Claim 19 relates to a laminated article. The laminated article comprises a fluoropolymer bonded to a substrate by a bonding composition including a light-absorbing compound and an electron donor exposed to actinic radiation. Furthermore, the fluoropolymer shares at least one covalent bond with the substrate.

Vasta does not teach, suggest or describe the invention described in amended claim 19. Particularly, the primer composition of Vasta is bonded directly to the substrate described therein (through the amino alkyl alkoxy silane component). The primer composition then interacts with the fluoropolymer to promote adhesion between the primer composition and the fluoropolymer. Since the fluoropolymer of Vasta never comes into contact with the substrate, it does not have at least one covalent bond with the substrate as described in amended claim 19.

The Applicants respectfully submit that the rejection of claim 19 under 35 USC § 102(b)/103(a) as being anticipated by or in the alternative obvious over Vasta has been overcome and kindly request that this rejection be withdrawn.

Tannenbaum

Claims 19 stands rejected under 35 USC § 102(b) as anticipated by or, in the alternative, under 35 USC § 103(a) as obvious over Tannenbaum.

Claim 19 relates to a laminated article. The laminated article comprises a fluoropolymer bonded to a substrate by a bonding composition including a light-absorbing compound and an electron donor exposed to actinic radiation. Furthermore, the fluoropolymer shares at least one covalent bond with the substrate.

Tannenbaum does not teach, suggest or describe the invention described in independent claim 19. In particular, the primer composition of Tannenbaum is bonded directly to the smooth substrate described therein. The primer composition then interacts with the fluoropolymer to promote adhesion between the primer composition and the fluoropolymer by forming a mechanical interlock. The fluoropolymer of Tannenbaum does not have at least one covalent bond with the substrate as described in amended claim 19.

The rejection of claim 19 under 35 USC § 102(b)/103(a) as being anticipated by or in the alternative obvious over Tannenbaum has been overcome and should be withdrawn.

§ 103 Rejections

According to the MPEP, “[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” See MPEP 2143 (emphasis added).

Stoeppelmann

Claim 9 stands rejected under 35 USC § 103(a) as being unpatentable over Stoeppelmann. Claim 9 ultimately depends upon claim 1 and further adds patentable features

thereto. Specifically, claim 9 relates to an article as described [ultimately] in claim 1 wherein the electron donor is a fluoroalkylamine.

For at least the reasons stated above with respect to claim 1, Stoeppelmann fails to teach, suggest or describe all of the claim limitations of amended claim 1, and thus also fails to do so for amended claim 9.

Furthermore, Stoeppelmann does not provide any suggestion or motivation to modify the disclosure of Stoeppelmann to include the use of a fluoroalkylamine. It is only in light of the present disclosure that the Examiner now asserts this adhesion-enhancing modification. Thus, the rejection of claim 9 as obvious in light of Stoeppelmann is improper.

The Applicants submit that the rejection of claim 9 under 35 USC § 103(a) as being unpatentable over Stoeppelmann has been overcome and kindly request that the rejection be withdrawn.

Stoeppelmann in view of Gillham

Claim 5 stands rejected under 35 USC § 103(a) as being unpatentable over Stoeppelmann in view of Gillham et al. (U.S. Patent 3,309,425) [hereinafter Gillham]. Claim 5 depends upon claim 1 and further adds patentable features thereto. Specifically, claim 5 relates to an article as described in claim 1 wherein the light-absorbing compound includes a phosphonium compound.

For at least the reasons stated above with respect to claim 1, Stoeppelmann fails to teach, suggest or describe all of the claim limitations of amended claim 1, and thus also fails to do so for amended claim 5.

Gillham relates to thermoplastic resins containing phosphonium salts as flame-retardant agents. Gillham does not teach, suggest or describe a fluoropolymer that shares at least one covalent bond with a substrate as described in amended claim 1. Thus, the combination of Gillham and Stoeppelmann fails to describe all of the limitations of amended claim 1.

Furthermore, there is no suggestion in Stoeppelmann to modify the composition described therein to include phosphonium compounds. The success of the adhesion composition described in Stoeppelmann depends upon the presence of a $\text{NH}_2:\text{COOH}$ end-group ratio in the range of 1.5:1 to 3:1. Stoeppelmann, column 3, lines 59-63. The addition of cationic additives to the adhesion promoter composition may have an adverse effect on that end-group ratio. The

Patent Office has not established a reasonable expectation of success in making this specific modification by adding this particular flame-retardant.

The Patent Office has not met its burden of showing all of the claim elements of amended claim 5; it has not shown motivation to modify the disclosures of Stoepplmann and Gillham to provide this specific additive to Stoepplmann; and it has not met its burden of establishing a reasonable expectation of success upon making such a modification. Thus, the Patent Office has not met its burden of establishing a prima facie case of obviousness with respect to claim 5 in light of Stoepplmann in view of Gillham.

The Applicants respectfully submit that the rejection of claim 5 under 35 USC § 103(a) as being unpatentable over Stoepplmann in view of Gillham has been overcome and kindly request that the rejection be withdrawn.

Tannenbaum in view of Friedman

Claim 11 stands rejected under 35 USC § 103(a) as being unpatentable over Tannenbaum in view of Friedman et al. (U.S. Patent 5,908,704) [hereinafter Friedman]. Claim 11 depends upon claim 1 and adds patentable features thereto. Specifically, claim 11 relates to an article described in claim 1 wherein the bonding composition includes a vinyl silane.

For at least the reasons stated above with respect to claim 1, Tannenbaum fails to teach, suggest or describe all of the claim limitations of amended claim 1, and thus also fails to do so for amended claim 5. Friedman relates to protective glazing laminates. Friedman states, however, that the fluoropolymer films cannot be bonded directly to the substrates (in Friedman, these substrates were glass). See Friedman, column 3, lines 55-58. Instead, Friedman stresses the necessity of adding "coupling agents" to facilitate bonding between the fluoropolymer and the substrate surface. See Friedman, column 4, lines 35-49. Combining the disclosure of Friedman with that of Tannenbaum does not overcome the deficiencies of Tannenbaum with respect to claim 1.

The Patent Office has not met its burden of showing all of the claim elements of amended claim 11. Therefore, the Patent Office has not met its burden of establishing a prima facie case of obviousness with respect to claim 11 in light of Tannenbaum in view of Friedman.

The Applicants respectfully submit that the rejection of claim 11 under 35 USC § 103(a) as being unpatentable over Tannenbaum in view of Friedman has been overcome and kindly request that the rejection be withdrawn.

Double Patenting Rejection

The Patent Office has rejected claims 1-3, 5, 6, 8, 12 and 13 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6, 8-10, 14 and 15 of U.S. Patent No. 6,451,925 [hereinafter Jing]. The Patent Office admits that the claims are not identical, but asserts that the claims are not patentably distinct. The Patent Office asserts that the inventions of the instant claims 1-3, 5, 6, 8, 12 and 13 represent a genus of which the inventions described by claims 6, 8-10, 14 and 15 of Jing are species.

Applicants respectfully traverse the obviousness-type double patenting rejection. Jing describes compositions useful for bonding a fluoropolymer to a substantially non-fluorinated polymer. Importantly, the composition described in Jing is a tie layer that is placed between a desired fluoropolymer layer and a substantially non-fluorinated outside layer. See Jing, column 9, lines 28-31. Thus, the fluoropolymers of Jing do not share at least one covalent bond with the substrate.

One advantage of the present invention is that it avoids the potentially deleterious effects caused by interposing such a tie layer between the fluoropolymer and the substrate. Such tie layers may reduce the effectiveness of the individual fluoropolymer and substrate layers, for instance, in providing chemical and diffusion resistance in fuel hose constructions.

For the foregoing reasons, the Applicants respectfully submit that the double patenting rejection of claims 1-3, 5, 6, 8, 12 and 13 has been overcome and kindly request that this rejection be withdrawn.

Conclusion

It is respectfully submitted that the application is in condition for allowance, and a favorable action to that end is courteously solicited. In the event the Examiner would prefer language other than that set forth in the claims, it is requested that a telephone interview be had to assist in expediting the prosecution of the application.

Respectfully submitted,

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